

ABSTRACT OF THE DISCLOSURE

In addition to ordinary MOS gate, drain and source, a semiconductor element includes a control gate having geometry, which is defined only by a group of straight lines along a rectangular form of the MOS gate, is not defined by an oblique line and provides a nonuniform gate length at least in one of regions aligned in a direction of a gate width. A channel region formed by the control gate provides a region of strong electric fields and a region of weak electric fields. Consequently, a conductance of a whole channel region formed by the MOS gate and the control gate, i.e., a gain coefficient β of the semiconductor element can be modulated in accordance with voltages applied to the MOS gate and the control gate.